YUN CHENG (JOE) WANG

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Hughes Aircraft Electrical Engineering Center (EEB), 3740 McClintock Avenue, Los Angeles, CA

EDUCATION

University of Southern California — Los Angeles, CA
Ph.D. in Electrical and Computer Engineering — Jan. 2021 - May 2024 (Expected)
Advisor: Professor C.-C. Jay Kuo

University of Southern California — Los Angeles, CA
M.S. in Electrical and Computer Engineering, GPA: 4.0/4.0 — Aug. 2018 - Dec. 2019

National Taiwan University — Taipei, Taiwan
B.S. in Electrical Engineering, GPA: 3.8/4.3 — Sep. 2014 - Jun. 2018

RESEARCH INTERESTS

Knowledge Graphs, Data Mining, Representation Learning, Machine Learning on Graphs, Lightweight and Efficient Machine Learning Models, Natural Language Processing, Perceptual Quality Assessment.

TECHNICAL SKILLS

- **Programming Languages:** Python, C++, Matlab, and SPARQL
- **Software & APIs:** Apache Spark, Neo4j, Git, PyTorch, scikit-learn, XGBoost
- **Coursework:** Probability and Statistics, Linear Algebra, Analysis of Algorithms, Convex Optimization, Machine Learning Foundations, Digital Speech Processing, Digital Image Processing, Multimedia Compression

RESEARCH AND INDUSTRY EXPERIENCE

USC Media Communication Lab (MCL) — Los Angeles, CA
Research Assistant — Jan. 2021 - Present

- *Knowledge graph completion*
- – Infer missing information in knowledge graphs based on the observed triples.
- – Focus on various knowledge graph completion tasks including link prediction, triple classification, entity type prediction, and entity alignment.
- – Develop models that achieve SOTA results in low dimensions, i.e. 32 dimensions, on most knowledge graph datasets. The results are comparable with models in high dimensions, i.e. 500 dimensions.
- *Blind image and video quality assessment*
- – Predict mean opinion scores (MOS) for in-the-wild images and user-created videos with no reference.
- – Develop lightweight models on the user end that achieves SOTA results on synthetic datasets and comparable results with deep learning models on authentic datasets with a 54x smaller model size.
- – Allow real-time inference on CPUs which takes 38ms to process one image in average.

Academia Sinica — Taipei, Taiwan
Research Assistant — Sep. 2020 - Dec. 2020

- Improve word embeddings for Chinese words by incorporating the semantic constituents.
- Leverage structured word definitions in a lexical knowledge base, E-HowNet, which annotates 95K Chinese words, to compose word embeddings using multi-relational graph convolutional networks.
- Combine with masked language models to improve the performance of downstream Chinese applications.

Taboola Inc.   Los Angeles, CA
Data Science Intern   Jun. 2019 - Aug. 2019

- Build a large-scale knowledge graph to discover trending topics in daily news articles.
- 5,000 news articles from multiple publishers are injected into the knowledge graphs every day and the entire pipeline can be run within an hour.

PROJECTS

Knowledge Graph for Music Recommendation   Dec. 2021
DSCI558 Final Project

- Crawl and query data from lastfm and wikidata to construct a knowledge graph of soundtracks.
- Train embeddings for soundtracks, artists, genres, and lyrics to build a recommendation system.

Object and Key Phrases Retrieval for YouTube Videos   Mar. 2019
LA Hacks 2019

- Improve YouTube search engine to allow searching for specific objects or key phrases in videos.
- Use Google Cloud Platform to build the backend and React to build the frontend.

Drama Storyteller   Jul. 2018
Collaboration between NTU MPAC Lab and KKStream

- Identify storyline in each episode of dramas with machine learning models and extract a video thumbnail.
- Subjective and A/B tests are conducted. The project is selected to be presented in the annual company meeting.

PUBLICATIONS

[1] **Yun-Cheng Wang**, Xiou Ge, Bin Wang, C.-C. Jay Kuo, "GreenKGC: A Lightweight Knowledge Graph Completion Method", *arXiv preprint, 2022*.

[2] Xiou Ge, **Yun-Cheng Wang**, Bin Wang, C.-C. Jay Kuo, "CompoundE: Knowledge Graph Embedding with Translation, Rotation and Scaling Compound Operations", *arXiv preprint, 2022*.

[3] Zhanxuan Mei, **Yun-Cheng Wang**, Xingze He, C-C Jay Kuo, "GreenBIQA: A Lightweight Blind Image Quality Assessment Method", *IEEE MMSP, 2022*.

[4] Xiou Ge, **Yun-Cheng Wang**, Bin Wang, C.-C. Jay Kuo, "CORE: A knowledge graph entity type prediction method via complex space regression and embedding", *Pattern Recognition Letter, 2022*.

[5] **Yun-Cheng Wang**, Xiou Ge, Bin Wang, C.-C. Jay Kuo, "KGBoost: A Classification-Based Knowledge Base Completion Method with Negative Sampling", *Pattern Recognition Letter, 2022*.

[6] Bin Wang, Fenxiao Chen, **Yun-Cheng Wang**, C.-C. Jay Kuo, "Efficient Sentence Embedding via Semantic Subspace Analysis", *International Conference on Pattern Recognition (ICPR), 2020*.

[7] Fenxiao Chen, **Yun-Cheng Wang**, Bin Wang, C.-C. Jay Kuo, "Graph representation learning: A survey", *APSIPA Transactions on Signal and Information Processing, 2020*.

[8] Bin Wang, Angela Wang, Fenxiao Chen, **Yun-Cheng Wang**, C.-C. Jay Kuo, "Evaluating word embedding models: Methods and experimental results", *APSIPA Transactions on Signal and Information Processing, 2019*.

PRESENTATIONS, MENTORING, AND PROFESSIONAL SERVICE

- Reviewer - *Journal*: IEEE/ACM TASLP (2022), *Conference*: ECML-PKDD (2022).
- Student member - IEEE signal processing society, 2018 - present.
- Poster "Rule-Guided Knowledge Graph Completion: A Binary Classification Approach" presented at the 11-th USC ECE research festival, October 2021.
- Invited talk on "Introduction to Knowledge Graphs: Construction, Embeddings, and Applications" in a seminar for electrical engineering graduate students at NTNU, Taipei, Taiwan, Sep. 2020.
- Course mentor - USC EE503: Probability for Electrical and Computer Engineer, Fall 2019.